8.16 A trapezoid is isosceles if and only if its diagonals are congruent. *(p. 543)*

8.17 **Midsegment Theorem for Trapezoids** The midsegment of a trapezoid is parallel to each base and its length is one half the sum of the lengths of the bases. *(p. 544)*

8.18 If a quadrilateral is a kite, then its diagonals are perpendicular. *(p. 545)*

8.19 If a quadrilateral is a kite, then exactly one pair of opposite angles are congruent. *(p. 545)*

9.1 **Translation Theorem** A translation is an isometry. *(p. 573)*

9.2 **Reflection Theorem** A reflection is an isometry. *(p. 591)*

9.3 **Rotation Theorem** A rotation is an isometry. *(p. 601)*

9.4 **Composition Theorem** The composition of two (or more) isometries is an isometry. *(p. 609)*

9.5 **Reflections in Parallel Lines** If lines k and m are parallel, then a reflection in line k followed by a reflection in line m is the same as a translation. If P'' is the image of P, then:

(1) $\overline{PP'}$ is perpendicular to k and m, and
(2) $PP'' = 2d$, where d is the distance between k and m. *(p. 609)*

9.6 **Reflections in Intersecting Lines** If lines k and m intersect at point P, then a reflection in k followed by a reflection in m is the same as a rotation about point P. The angle of rotation is $2x°$, where $x°$ is the measure of the acute or right angle formed by k and m. *(p. 610)*

10.1 In a plane, a line is tangent to a circle if and only if the line is perpendicular to a radius of the circle at its endpoint on the circle. *(p. 653)*

10.2 Tangent segments from a common external point are congruent. *(p. 654)*

10.3 In the same circle, or in congruent circles, two minor arcs are congruent if and only if their corresponding chords are congruent. *(p. 664)*

10.4 If one chord is a perpendicular bisector of another chord, then the first chord is a diameter. *(p. 665)*

10.5 If a diameter of a circle is perpendicular to a chord, then the diameter bisects the chord and its arc. *(p. 665)*

10.6 In the same circle, or in congruent circles, two chords are congruent if and only if they are equidistant from the center. *(p. 666)*

10.7 **Measure of an Inscribed Angle Theorem** The measure of an inscribed angle is one half the measure of its intercepted arc. *(p. 672)*

10.8 If two inscribed angles of a circle intercept the same arc, then the angles are congruent. *(p. 673)*

10.9 If a right triangle is inscribed in a circle, then the hypotenuse is a diameter of the circle. Conversely, if one side of an inscribed triangle is a diameter of the circle, then the triangle is a right triangle and the angle opposite the diameter is the right angle. *(p. 674)*

10.10 A quadrilateral can be inscribed in a circle if and only if its opposite angles are supplementary. *(p. 675)*

10.11 If a tangent and a chord intersect at a point on a circle, then the measure of each angle formed is one half the measure of its intercepted arc. *(p. 680)*

10.12 **Angles Inside the Circle** If two chords intersect inside a circle, then the measure of each angle is one half the sum of the measures of the arcs intercepted by the angle and its vertical angle. *(p. 681)*

10.13 **Angles Outside the Circle** If a tangent and a secant, two tangents, or two secants intersect outside a circle, then the measure of the angle formed is one half the difference of the measures of the intercepted arcs. *(p. 681)*

10.14 **Segments of Chords Theorem** If two chords intersect in the interior of a circle, then the product of the lengths of the segments of one chord is equal to the product of the lengths of the segments of the other chord. *(p. 689)*

10.15 **Segments of Secants Theorem** If two secant segments share the same endpoint outside a circle, then the product of the lengths of one secant segment and its external segment equals the product of the lengths of the other secant segment and its external segment. *(p. 690)*

10.16 **Segments of Secants and Tangents Theorem** If a secant segment and a tangent segment share an endpoint outside a circle, then the product of the lengths of the secant segment and its external segment equals the square of the length of the tangent segment. *(p. 691)*

11.1 **Area of a Rectangle** The area of a rectangle is the product of its base and height. $A = bh$ *(p. 720)*